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Intellectual Property Protection for Farming Cropping Patterns and Rice Farming Products in Supporting Food Security

Prof. Dr. Rahmi Jened, S.H., M.H.

Full Professor, Business Law Department, Faculty of Law, Airlangga University, INDONESIA
Email: jenedjened@yahoo.com; rahmi.jened.nasution@gmail.com

Dr. Agung Sujatmiko, S.H., M.H.

Associate Professor, Business Law Department, Faculty of Law,
Airlangga University, INDONESIA
Email: agung.sujatmiko73@gmail.com

Ria Setyawati, S.H., LL.M.

Junior Lecturer, Business Law Department, Faculty of Law, Airlangga University, INDONESIA
Email: ria.setyawati@gmail.com

Abstract

The Republic of Indonesia is the largest archipelagic country in the world with nearly 17,000 islands in an area of 1,826,440 square km. The largest islands are Kalimantan, Papua, Sulawesi, Sumatra and Java. Most of the smaller islands are not yet inhabited and even only the island of Java alone occupies nearly 60% of the total population in Indonesia which recorded 306,264,595 people in 2005 (Central Bureau of Statistics, 2006).

Indonesia which has bio mega diversity coupled with local wisdom of society in conducting agricultural cropping patterns and rice farming products has a very big potential, or should it be called risk, to be exploited by foreign companies. As an illustration, an incident occurred in Sulawesi where local farmers were persuaded by Monsanto, the largest seeds multinational company in the world, to switch from the rice seeds usually farmed there to the cotton seeds from Monsanto. Monsanto promised to buy the harvested cotton products at a high price. However, the harvested products were eventually said to not meet Monsanto's standards and were not purchased. Another example of problems that occur to Indonesian farmers is criminalization over traditional farmers by PT BISI as a subsidiary of Monsanto in Indonesia.

This research's objective is to study what types of cropping patterns and their each subsequent rice farming product usually used in Indonesia, what existing laws and regulations that are related to the protection of such patterns and products in Indonesia, and which among the patterns and products can be an immense potential to support food security in Indonesia.

Key words: cropping pattern, rice farming product, intellectual property, food security.

1. Introduction

The Republic of Indonesia is the largest archipelagic country in the world with more than 17,000 islands in an area of more than 1,9 million square km.¹ The largest islands are Kalimantan, Papua, Sulawesi, Sumatra and Java. Most of the smaller islands are inhabited and even only the island of Java alone occupies nearly 60% of the total population in Indonesia which recorded 306,264,595 people in 2005.²

Indonesia consists of 34 provinces. Every province has its own special products that generate income per capita (gross domestic product/ GDP) by 6% in 2005.³ GDP comprises the private and governmental expenditures. Contribution of agriculture and plantation sector amounted to US \$ 2,438,500 and other related sectors amounted to US \$ 5,400,000.⁴ However, it turns out from these amounts, there are a lot of agricultural/ plantation products that are managed by Multinational Corporation (MNC) or Transnational Corporation (TNC).⁵

In relation to the Richard Cook, a former analyst with the US Federal Government, in his "*Crisis In Food Prices Threatens Worldwide Starvation: It Is Genocide*",⁶ states that it is the time for the country to reaffirm the importance of a distinct policy in agricultural sector, so that the food production will not be controlled by agribusiness companies and financial capitalists internationally through MNC.

According to the annual report issued by *The South Center* in 2006 that 75% of cereal products (grains) is controlled by 2 MNC, 50% of banana production and trade is also controlled by 2 MNC, 83% of cacao product and trade by 3 MNC, 85% of tea products and trade by 3 MNC, 83% of sugar products and trade by 3 MNC, and pesticide and supporting agricultural/ plantation products are controlled by 4 MNC.⁷

One of the giant MNCs is Monsanto a leading biotechnology company from the US which has a production capacity, mainly in food crop seeds, that has amounted to US \$ 6 billions in 2005-2006 to US\$ 20 billions in 2010.⁸ Nowadays, Monsanto has mastered 91% of the total

¹ <http://data.un.org/CountryProfile.aspx?crName=indonesia>

² Central Bureau of Statistics, Annual Report, Jakarta, 2005, p.3

³ Asean Development Bank (ADB), Indonesian Report, Manila, p. 23

⁴ *Ibid.*

⁵ Defined by John H. Dunning as: "A multinational enterprise is one roommate undertakes foreign direct investment, the which owns or controls income assets in more than one country and in doing so produces goods and services outside its country of origin ie. Engages in international production". Rahmi Jened, *Teori dan Kebijakan Hukum Investasi* (Theories and Policies of Investment Law), Prenada Media, Jakarta, p. 133 (quoted from Ray August p. 202)

⁶ Kompas, Global Food Crisis, Jakarta, 8 Agustus 2008, p.1

⁷ <https://www.southcentre.int/>

⁸ *Op.Cit.*, ADB, Indonesian Report, Manila, p.23

area under cultivation of organic crops around the world together with Sygenta and Aventis Corp Science, which each holds 287 patents, 173 patents and 77 patents on transgenic seeds of food plants.⁹

There seems to have been a lot of acts of exploitation and abuse of intellectual property rights (IPR) by this MNC, which ultimately damage the farmers. For instance, an incident occurred in Sulawesi where local farmers were persuaded by Monsanto, the largest seeds multinational company in the world, to switch from the rice seeds usually farmed there to the cotton seeds from Monsanto.¹⁰ Monsanto promised to buy the harvested cotton products at a high price.¹¹ However, the harvested products were said to not meet Monsanto's standards and were not purchased because of their high water content.¹² The farmers did not gain profit from farming the cotton and instead, they suffered a huge loss as the rice farming period had passed and the potential economic gains they could have achieved was gone. Another instance was criminalization over local farmers by BISI Ltd. Co., a subsidiary of Monsanto in Indonesia. BISI brought their case before the court with claims that traditional farmers in Jember and Kediri (in East Java Province) had contaminated their crops which had been protected by Plant Varieties Rights (PVR).¹³

Such instances show how important intellectual property rights (in this case patent and PVR) are. Protection for cropping patterns and rice products is very crucial for the world's needs of food, fibers and as well as of raw materials used in different industries. Nevertheless, the need of food is, and if still is not, should be the paramount objective of such protection. It is estimated that by 2020 the world population will reach 80 billions and 83% of them live in developing countries.¹⁴ Therefore, annual food production will increase to 3,000 *metric tons* from currently 1,800 *metric tons*.¹⁵ The annual demand of food production will continue to rise while in contrast, agricultural land will continue to decline as a result of the construction of housing and industrial purposes among others. Besides that, the increase in the demand for flower species plants and other ornamental plants for their visual or entertainment value also becomes the cause of the decrease

⁹ *Op.Cit.*, <https://www.southcentre.int/>

¹⁰ Discussion with *PT. Pegadaian (PERSERO)*, the state-owned financial services company with main services in pawning, during field research about the grain pledge in the area of Bulukumba and Makassar (The Province of South Sulawesi); Rahmi Jened, "Potential and Protection on Intellectual Property of *PT. Pegadaian (PERSERO)*", Jakarta, 2008. It can also be seen on the news "45 Officers of Ministry of Agriculture Involved in Monsanto Case", www.antikorupsi.org/en/content/45-pejabat-deptan-terlibat-kasus-monsanto, also at Liputan 6, Metro TV, "The Department of Agriculture Banten Reject Monsanto Transgenic Cheap Seeds Offers, Business Coverage", Ridho Syaiful Ashadi, "Imperialism in Corn Field"

¹¹ *Ibid.*

¹² *Ibid.*

¹³ *Ibid.*

¹⁴ Graham Dutfield, Plant Variety Protection, Teaching Material, European Community and ASEAN Intellectual Property Cooperation Program (ECAP)II, Queen Mary Intellectual Property Research Institute University of London, London UK, 2005, p. 2

¹⁵ *Ibid.*

in agricultural productivity. On top of that, the research and development of new plant varieties to sustain food security and be commercially successful requires a long and difficult process. It takes a lot of time, energy and money. All that can lead to a process of 10 to 20 years.

2. Methods

The importance of this study is to provide a solution on the protection of cropping patterns and rice products in order to contribute some ideas for the decision makers for creating policies and regulations that support the national food security.

The type of this research is normative juridical and empirical legal. Normative juridical research is conducted by reviewing and analyzing laws and regulations pertaining to the protection of cropping patterns and rice products. It uses statutory approach, conceptual approach and comparative approach. Empirical legal research is conducted by field research.

The location of the research is selected agricultural areas in the provinces of East Java, Bali, Central Java and West Java. These selected areas are dense with both, farms and thus, the knowledge related to farming.

Primary data collection is done by field observation and structured interview. Secondary data collection is done by inventory and categorization based on card system. All data were analyzed qualitatively and presented descriptively.

The research problems are: 1. What types of cropping patterns and their each subsequent rice product that are used in Indonesia? 2. What existing laws and regulations pertaining to the protection of cropping patterns and rice farming products? 3. What are the types of cropping patterns and rice farming products that can be an immense potential to support Indonesian food security?

3. Results

3.1 Types of Cropping Patterns and Their Each Subsequent Rice Product

From the results of field research, it is known that rice products can be planted through different types of cropping patterns, they are:¹⁶

- (a) Conventional cropping pattern;
- (b) System of Rice Intensification (SRI), whether conventional or organic;
- (c) *gogo rancah*;
- (d) poly-culture;

¹⁶ Interview with Koos Kuntjahjo, S. H., Agriculture Business Unit Manager of *Induk Koperasi Purnawirawan ABRI (INKOPEPABRI)*, the Retired Indonesian Armed Forces' Parent Coop Institution, 8 April 2016.

- (e) *mina padi*;
- (f) *jajar legowo*;
- (g) *hazton*;
- (h) organic supplement plant (OST); or
- (i) *ratoon* cropping pattern.

Land management for conventional cropping pattern uses human power, animal or tractor with the orders of plowing the soil, raking it and then leveled it. In conventional farming is, there no special technique for selecting seeds. Seeds just soaked in water for 1 day 1 night and they are ripened for 2 days and 2 nights. Then, the seeds are ready to be seeded, unnecessary part is removed and cleaned of soil attached to the roots and the leaves are cut and divided into portion to be ready to be planted. Seeds must be rested for 1 hour to 1 day before planting. On conventional farms seeds that are ready for planting are 18-25 days after sowing.

SRI method is a cropping pattern where the soil is raked and then fertilized using organic fertilizers. In the SRI method there is special technique to select seeds, which is using a salt solution. Water is poured into a jar and an egg is inserted. Then salt is added into the water and it is stirred slowly until the egg floats (as a marker of solution ready for use). Then the seeds to be planted incorporated into the salt solution. The seeds that sink are good quality seeds. Seeds are well taken, set aside and cleaned with water so the salt solution does not stick. Further, the seeds ripened for 1 day and 1 night (no more), and the seeds are ready for nursery. SRI method can be done by using a container with a seed between 5-10 kg /ha together with soil attached to the roots and be planted directly in the field (less than 30 minutes seedlings). Seeds ready for planting are the ones 7-12 days after sowing. One of the planting holes contains 1 seed plant. Seedlings are planted at a depth of 2-3 cm with a horizontal form-shaped root L. There is a good drainage system in each rice plot.

Gogo rancah is upland paddy cultivation on dry land. Upland rice paddy fields are grown directly on dry land. Farming the paddy fields done without cultivating the land (without being hoed), but enough with making holes with '*tugal*'. *Tugal* is a wooden stick with a diameter of 5-10 cm which is sharpened at the edges. This stick is used to make the planting hole. In *gogo rancah* water control is by means of a simple drainage to facilitate the conversion of water from dry to wet, especially on heavy textured soils. Arrangement of plants should be in a row and rectangular. Into this planting hole is inserted between 3-4 grains of rice seed. Furthermore, plants are allowed to grow naturally. Field rice is usually long-lived (in rice) that is between 5-6 months, with average production about 3-4 tons per hectare. Harvest and post-harvest management is made in line with the local economy and social traditions.

Polyculture (also called intercropping) is planting of two crops together on the same plot of land or planting them with short time intervals in between. Intercropping is a cropping system in

sequence between annual crops and annual crops. Intercropping is aimed at making the best use of the environment (nutrients, water and sunlight), utilizing the excess fertilizer provided to the main crops, increasing the income of each land area, providing income before the main crops produce to obtain maximum production. There are various polyculture cropping methods such as multiple cropping, relay cropping, mixed cropping and sequential cropping.

Mina padi, in principle, is the same cropping pattern as polyculture, but it creates some sort of fish pond. It forms a combination of rice planting area with fish pond on the sidelines of the bed or irrigation.

Jajar legowo farming cropping pattern as follows first Every two lines interspersed with one blank line with a width of twice the spacing, and at a spacing in a row that extends in shorten to half the spacing in the row. It can also be every three rows of rice plants interspersed with one empty row with a width of twice the spacing, and for planting distance of rice crops half-spaced into a row. Every four rows of rice crops interspersed with one empty row with a width of twice the spacing of the plant, and for the spacing of rice crops that are marginalized into half the spacing in the row.

Hazton comes from the word taken from the inventors' names: Hazairin and Anton. At the time of inventor doing research not through testing varieties with most tillers, plant spacing settings, the effect of fertilization, soil processing and so on. However, Hazairin and Anton used a simple initial hypothesis of how to multiply uniform and simultaneous productive breeds when removing the panicles. The research was conducted by planting seeds with the amount of 1, 5, 10, 20, 30 and 40 per planting hole. And the results show the best result is the number of seeds 20 - 30 per hole. The secret is due to the adaptation of rice physiology, where with the number of 20-30 seedlings each of the rice seedlings in the middle of the clump will be pinched and tend to be the main breed productive and produces the prime panicles. While the seeds that are on the edge of the clump will produce 1-3 tillers that are all productive. So the conclusion: with the number of seeds 20 - 30 per hole will produce productive till about 40 -60 tillers / clumps so that the number of sires and productive tillers that will result in increased productivity and production.

F1 rice seeds or Superior Hybrid Varieties (VHU) and which have a high specific gravity. The method of selecting specific gravity is carried out by a special method which begins to separate the seed by bucket fill with 8 liters of water and then insert 1 raw chicken egg to measure the amount of salt that must be entered bit by bit and stir until dissolved, but the chicken eggs do not break. Stop Adding salt when the eggs are floating, take the eggs and insert the rice seed that has been selected into the salt solution stir briefly then let stand. After the stable and no longer the

possibility of floating seeds, just do the separation. Remove all floating seeds, while drowned seeds are taken and cleaned with plain water to avoid getting any more water.

Ratoon rice farming products can only be applied to rice grown in paddy fields. After harvesting the remaining rice cutting remains harvested at an average height of 10 cm from the soil surface or if the dry season is cut to a height of 5cm from the soil surface. The media soil should dry at 0 days. Then the paddy fields are cleared of the remaining harvest straws and the former level of alignment up to 5 days. Rice fields in the water with humid watery conditions.

3.2 The Existing Legal Instruments pertaining to the Protection of Cropping Patterns and Rice Products

Pursuant to Article 33 paragraph 3 of the 1945 Indonesian Constitution, it is stated that: “The earth, the water and all the wealth contained therein are controlled by the state and as much as possible used for the welfare of the people”.¹⁷ The article is the legal politic principle for Indonesia to carry out economic development activities. It is the principle that the state has to uphold in managing its natural resources which is based primarily on agrarian society. Therefore the plants that exist in the earth of Indonesia and how the management and cultivation of its plants is part of The Constitution and should give the right for the people of Indonesia to participate in enjoying the prosperity. Thus, criminalization over local farmers by BISI Ltd. Co., a subsidiary of Monsanto in Indonesia should not have happened. Local farmers use traditional farming methods and the evidence whether they had contaminated crops protected by PVR should have been done more thoroughly. Even if there was a possibility that PVR was breached, there should have been considerations taken carefully related to the fact that the farmers use traditional farming methods.

The cropping pattern and rice farming products are regulated sporadically in various laws and regulations¹⁸ such as the Law number 5 year 1960 on Principles of Agrarian, Law number 11 year 1974 on Waterworks, Law number 5 year 1990 on Conservation of Natural Resources and Ecosystems, Law number 6 year 1994 on Ratification Of The United Nations Framework Convention On Climate Change, Law number 23 year 1997 on Environmental Management, Law number 41 year 1999 on Forestry, Law number 63 year 2002 on City Forest, and including customary law within the communities.

¹⁷ Indonesian Constitution Year 1945

¹⁸ Indonesian Law number 5 year 1960 on Principles of Agrarian; Law number 11 year 1974 on Waterworks; Law number 5 year 1990 on Conservation of Natural Resources and Ecosystems; Law number 6 year 1994 on Ratification Of The United Nations Framework Convention On Climate Change, Law number 23 year 1997 on Environmental Management, Law number 41 Year 1999 on Forestry, Law number 63 year 2002 on City Forest; Law number 12 year 1992 on Plant Cultivation System; Law of number 13 year 2016 on Patent

Unfortunately, these regulations do not expressly state the rights of traditional farmers in relation to management activities and cultivation of their crops either in a conventional way, based on their hereditary practices, based on their self-found practices or based on organic test that have not yet reached sophisticated genetic engineering activities.

Little about the rights of the farmer and his cultivation are listed in several articles of the Law number 12 year 1992 on Plant Cultivation System essentially regulates 3 (three) main points. Firstly it regulates the relationship between the State and farmers. Secondly it states the preservation of the environment and thirdly, the preservation of biodiversity. The national agricultural policy seems to be under review because the existing problems are unlikely to be resolved without a fundamental change in agricultural development policy. Especially with the desire and efforts made for food security will be more severe, if associated with the population. Some of the policies that need to be reviewed are:

- a. Less policies facilitate research on industrial-supported commodities or export-oriented enterprises;
- b. Policies and guidance are less supportive of agro-business and agro-industry developments that are shifting to farmers or rural communities;
- c. Agricultural policy does not support the development of specific commodities from locations or regions that have competitive and comparative advantages.

Considering the lack of regulations governing the cropping pattern and the production of rice including of farmers' right no wonder traditional farmers become a tool for the exploitation of the industry and if it is like that must not be assured farmers with the management of rice crops can support the food security of the state of Indonesia.

3.3 *Ratoon* Cropping Pattern and Its Rice Product in Supporting Food Security

Food security is defined as: "a broad concept used to determine people's general wellbeing.¹⁹ Food security exists when all people at all the times have physical economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for and healthy life" (World Food Summit 1996).²⁰ The Parameter of Food Security are:²¹ (1) physical availability of food, (2) economic and physical access to food, (3) food utilization and (4) stability of the other of three dimensions overtime.

Based on the results of the field study the researchers noticed that the pattern of planting and cultivation of rice through paddy "*Ratoon*" may be able to support the food security given the many advantages. *Ratoon* does not requiring new land, does not need a complex system of

¹⁹ <http://www.fao.org/forestry/13128-0e6f36f27e0091055bec28ebe830f46b3.pdf>

²⁰ *Ibid.*

²¹ *Ibid.*

irrigation, does not require seed lot and the result is almost the same even 90% of as the result of the former native rice harvest paddy organized into “*Paddy Raton*”.

Observed the result of cropping pattern and the management and production of *Paddy Raton rice* for four months in farmer Koos Kontjahjo’s farm, the researcher team is optimistic to register it as a simple patent/ utility model whose ultimate purpose will give exclusive rights to farmer Kontjahjo who wishes to donate this invention in order to be practiced all over Indonesia and while preventing the abuse of this invention by irresponsible parties. The hope with patent rights, then Kontjahjo will be able to contribute to Indonesia and his invention of cropping pattern and management of *Ratoon* rice production able to support the food security in Indonesia.

The invention is already filed under Simple Patent (Utility Model) Registration with agenda number S0020101600 on 11 October 2016 titled, “Management Method of Paddy *Ratoon*”, and the description is as follows:²²

1. Flatten the pieces of the remaining trees harvested paddy has been completed with an average height of 10 cm from the ground (in the dry season was cut to a height of 5 cm), the planting medium dry conditions (age 0 days).
2. Clean the area of rice fields of the remnants of the former hay harvest and smoothing the cut tree trunk rice (age s / d 5 days).
3. Rice filled * with water until humid conditions watery condition.
4. At the age of 7 days sprinkle NPK plus as many as 20 bags @ 25 kg.
5. Conditions humid conditions watery planting medium.
6. Do *ngoyos* or revocation of grass and weeds at the age of 12 days.
7. At the age of 14 days to apply as much as 100 kg urea, planting in the conditioned media remainsin humid conditions watery.
8. Spraying liquid organic fertilizer super 5 bottles (@ 500 ml) per hectare (at 15 days).
9. Keep the growing medium conditions remain humid conditions watery conditions.
Spraying drug improvement
10. 5 tablets mixed with a liquid organic fertilizer super 3 bottles at the age of 19 days.
11. At the age of 20 days to apply *NPK mutiara* 100 kg, condition humid conditions watery planting medium.
12. Harvesting is done when the rice is ripe, aged between 45-60 days.

There are many advantages²³ of *Ratoon* cropping pattern and management compared to others cropping patterns. First, rice principal requires land management, while the *ratoon* rice is not.

²² Simple Patent (Utility Model) Registration, Agenda Number S0020101600, 11 October 2016 titled, “Management Method of Paddy *Ratoon*”

²³ Interview with Koos Kuntjahjo, S.H., *INKOPEPABRI*, 13 Agustus 2016.

Second Activities seedbed or seedling production necessary staple rice crop, rice *ratoon* crop residues principal capitalized after harvest to be managed. Third the amount of water needed in *ratoon* rice is only about 30% of staple rice crop water needs. Fourth, on the main crop planting seedlings, rice *ratoon* without their planting activities. Fifth activity no stitching staple rice crop, while the *ratoon* rice crop just maintain the rest of the staple rice crop. Sixth, the total requirement of urea in staple rice crop as much as 400 kg, while the *ratoon* rice only takes as much as 100 kg, the total requirement of *NPK mutiara* staple rice crop is 200 kg, while the total requirement of rice *ratoon* 100 kg. Seventh, the need NPK plus staple rice crop as much as 625 kg, 500 kg of rice *ratoon*. Eighth, the age staple rice harvests an average of 110 days, while the *ratoon* rice harvest life of 45-60 days. Finally, if staple rice crop yields as much as b kg, *ratoon* rice yields about 90% - 110% of kg, it means Raton production of rice is the same as its staple harvested rice crop.

This registration is regulated by Law of number 13 year 2016 on Patent. Patent is based on patentability requirements as is article 3 article to 5 and not included invention which is prohibited to be patented as stated in Article 9. A simple patent/ utility model is any new invention of development of a process or product that already exists and can be applied industrially.

4. Conclusion

1. There are different variations the cropping pattern paddy farming and agricultural products such as conventional cropping pattern, System Rice Intensification (SRI), *gogo rancah*, poly-cultural, *mina padi*, *jajar legowo*, *hazton*, organic supplement plant (OST), and *Ratoon*.
2. Sporadically there are various legal instruments governing the cropping pattern paddy farming and agricultural products, but unfortunately does not provide adequate protection for farmers and less able to guarantee food security for mutually coordinated and well integrated sector.
3. The cropping pattern paddy farming and agricultural products *Ratoon* would be the solution to food security Indonesia with many of its advantages. The protection of the cropping pattern paddy farming and agricultural products *Ratoon* through the patent system would allow the dissemination of this invention widely through government programs to ensure food security.

Acknowledgments and Legal Responsibility

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